



10/519,133

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- 1 -

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant: Bernd Papenfuhs, Martin Steuer and Simon Jonas

Application No.: 10/519,133 Group: 1713

Filed March 10, 2005 Examiner: Michael Bernshteyn

Confirmation No.: 7750

For: CROSS-LINKED POLYVINYL ACETALS

CERTIFICATE OF MAILING OR TRANSMISSION

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DECLARATION OF ROBERT W. FUSS, Ph.D. UNDER 37 C.F.R. §1.132

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

I, Robert W. Fuss, Ph.D., of Platanenweg 32, 65835 Liederbach am Taunus, Germany, hereby declare and state as follows:

1. I studied chemistry at the Universities of Braunschweig/Germany and Durham/England from 1982 to 1990, holding a Ph.D. Dunelm from the Faculty of Science of the University of Durham. I am a member of the Royal Society of Chemistry as MRSC and CChem. I have been employed since 1990 at Kuraray Europe GmbH (or its legal antecessor), where I have actively researched

polyvinyl alcohols, acetalized polyvinyl alcohols and their derivatives since 1997.
Currently I am head of Research and Development at Kuraray Europe GmbH.

2. I am an inventor of U.S. Patent 6,808,858 entitled "Use of Carboxyl Group-Containing Acetal Polymers in Light-Sensitive Compositions and Lithographic Printing Plates" (hereinafter the "858 Patent"). As such, I am thoroughly familiar with its contents. I have studied the '858 Patent again before making this Declaration.
3. I have been asked to comment on an Office Action mailed from the U.S. Patent Office on January 22, 2007, for U.S. Serial No. 10/519,133 entitled "Crosslinked Polyvinyl Acetal" (hereinafter the "Office Action"). I have thoroughly studied the Office Action and U.S. Serial No. 10/519,133 prior to making this Declaration.
4. In the Office Action, the examiner asserts in Section 13 that "it is the examiner [sic] position to believe that the product, i.e., a crosslinked polyvinyl acetal of Fuss [the '858 Patent] is substantially the same as a crosslinked polyvinyl acetal recited in claim 16, even though obtained by a different process". In this respect, I disagree with the Examiner. A person skilled in the art of lithography who reads the '858 Patent knows that a crosslinked polyvinyl acetal polymer is not desirable for the photosensitive composition described in the '858 Patent and would in fact be detrimental to the functioning of the photosensitive composition. As such, a person skilled in the art of lithography would not interpret the '858 Patent to contain a crosslinked polyvinyl acetal polymer. Moreover, a crosslinked polyvinyl acetal polymer is not formed by following the teachings of the '858 Patent. My reasoning in support of these assertions is provided in the Sections below.

5. The '858 Patent is directed to a photosensitive composition for lithographic printing plates. Lithographic printing technique involves applying a photosensitive composition to a printing plate, creating the desired printing patterns by exposing segments of the printing plate to light, developing the exposed parts, removing the non-exposed and non-developed parts with water, covering the remaining parts of the surface of the printing plate with ink and finally printing.
6. The photosensitive composition in the '858 Patent contains: 1) a binder; and 2) a photosensitive material.

The photosensitive material in the '858 Patent is described by point (i) column 3, line 16 to 24. Exposure to lights causes the material to form a hard, scratch-resistant layer which survives the developing and washing steps. The photosensitive material comprises:

- at least one, preferably one, diazonium polycondensate (see for example column 11, 36-39); *or*
 - or at least one, preferably one, system capable of free radical polymerization and comprising photo initiators and unsaturated compounds which are capable of free radical polymerization (see for example column 12, 44-50); *or*
 - or at least one, preferably one, hybrid system comprising a diazonium polycondensate and a system capable of free radical polymerization and comprising photoinitiators and unsaturated compounds which are capable of free radical polymerization (see for example column 13, 26-35).
7. The binder needs to fullfill certain physical and chemical requirements, *inter alia* should have hydrophilic groups for good solubility in aqueous alkaline media (see column 1, line 32-42 of the '858 Patent). The "858 Patent describes the polymer

at point (ii) column 3, line 25 to column 4 line 22, as a polyvinyl acetal comprising hydroxyl groups (II) and up to 20 mol% carboxyl groups (formula IV).

8. The hydroxyl and carboxyl groups in the polyvinyl acetal polymer do not react to form crosslinks under the conditions described in the '858 Patent. For example, the '858 Patent describes the preparation of the polyvinyl acetal polymers beginning at column 5, line 5, including an acetalization reaction at column 5, line 10 which is undertaken at "temperatures from 0 to 90° C". However, esterification of a carboxyl group with an alcohol requires temperatures far greater than 90° C, (typically greater than 150°C). As such, the polymer is not crosslinked by exposure to these temperatures. Indeed, the '858 Patent itself provides evidence that the polymers are not crosslinked. Specifically, the glass temperature Tg of the binder is 81 to 91° C in Preparation Examples 1-4. If the binder were cross-linked at such temperatures, the Tg would be much higher.

Although the Office Action does not identify any other passage in the '858 Patent as allegedly describing conditions which would cause the polyvinyl acetal to crosslink, I wish to state for the record that nowhere in the '858 Patent is there any description of conditions which would cause the polyvinyl acetal polymer to crosslink. For example, the polyvinyl acetal polymers, including their carboxyl groups and hydroxyl groups, are not photoreactive and therefore do not react when the photosensitive materials in the composition are exposed to light.

9. Moreover, one skilled in the art holography would not select conditions which would cause crosslinking of the polyvinyl acetal polymer when carrying out the invention described in the '858 Patent because such crosslinking is undesirable for a number of reasons, including the following:
 - The non-exposed parts of the printing plated need to be water soluble so that the parts that have not been exposed with light (and are therefore non-developed) can be removed by washing with water (see Section 5 above)

The more carboxyl groups, the better the water solubility. Crosslinking (esterification) would consume the carboxyl groups and thereby reduce water solubility even before the binder is employed in the photosensitive composition.

- High-contrast printing is desired. Therefore the washing and developing procedure should result in a sharply defined ink-receiving layer. To achieve this, the solubility of the binder needs to be in a defined range. A mixture of esterified, partly esterified and not esterified binder molecules does not result in a defined solubility and in the long run, would not result in a high contrast printing.

10. The Office Action in Section 11 refers to column 4, line 29-31 to support the assertion that the polyvinyl acetal polymers in the '858 Patent are crosslinked.

This passage is reproduced below:

It is thus possible to obtain tailor-made polymers which are suitable for use in photosensitive compositions based on different photocrosslinking mechanisms.

A person skilled in the art of lithography would immediately understand this passage to refer to *photocrosslinking* i.e. to the reaction of light and the photosensitive materials described in section (i) beginning at column 3, line 14. A person skilled in the art of lithography would immediately know that this passage does *not* refer to the binder, i.e., the polyvinyl acetal polymer, described in section (ii) beginning at column 3, line 25. The polyvinyl acetal polymer in the '858 Patent does not contain double bonds and therefore *cannot be* photocrosslinked under the conditions disclosed in this patent.

11. In summation, one would not obtain a crosslinked polyvinyl acetal polymer by following the teachings of the '858 Patent. The conditions described therein for preparing the ingredients of the photosensitive composition, for preparing the photosensitive composition itself and for using the photosensitive composition are not suitable for crosslinking a polyvinyl acetal polymer. Moreover, one skilled in the art of lithography knows that crosslinking is undesirable for a polyvinyl acetal polymer when used for lithographic printing. As such, a person skilled in the art

- 6 -

lithography would seek to avoid conditions which result in crosslinking of this polymer and would not seek to modify the polyvinyl acetal polyiner it by utilizing crosslinking conditions.

12. I further declare that all statements herein of my own knowledge are true and that all statements made on information in belief are believed to be true; and further that the statements are made with the knowledge that willful false statements of the like so made are punishable by fine or imprisonment or both Under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issuing thereof.

Robert W. Fuss 25-05-2007
Robert W. Fuss, Ph.D. Date